**Predicting Presence of Nutrients and Pesticides in Base Flow Conditions of First-Order Streams in the Mid-Atlantic Coastal Plain**

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Excess nutrients and pesticides in the environment can cause a variety of ecological and human health effects. When nutrients are unused by plants or pesticides remain after use on their intended target, these compounds can be transported to streams, either directly through overland flow or through percolation through the soil, eventually contributing to ground water discharge, sometimes termed "base flow," in a stream. Elevated concentrations of pesticides or nutrients can make water unfit for human consumption and cause adverse effects on aquatic organisms (Briggs, 1992).

The Landscape Indicators for Pesticides Study in Mid-Atlantic Coastal Streams (LIPS-MACS) is a collaborative research effort between the U.S. Environmental Protection Agency's Office of Research and Development and the U.S. Geological Survey's National Water Quality Assessment Program. One of the objectives of the study was to develop models to relate land use, geology, and other geographic variables to water quality and aquatic ecology in small streams of the Mid-Atlantic Coastal Plain. A base network of 174 small (typically first-order) streams was selected across a gradient of hydrogeologic and land-use settings from a population of 10,144 first-order watersheds in the region. Water samples were collected from all 174 streams and analyzed for selected pesticides, pesticide metabolites, nutrients, and major ions. Benthic-community and habitat assessments were also conducted at each stream. A database of landscape metrics computed from soils, land-use, and topographic data for each sampled watershed was compiled.

We used logistic regression to analyze the relationship between the presence of pesticides and nutrients at various levels (dependent variables) and our suite of landscape metrics (independent variables). We will present our results for metolachlor, an herbicide; nitrate plus nitrite as total nitrogen; and total phosphorus. We were able to predict the presence of metolachlor at levels above 0.06 :g/L with an 87% concordance and at levels above 1:g/L with an 86% concordance. Nitrate plus nitrite was predicted at levels above 0.71 mg/L (ecoregional nutrient criteria) with a concordance of 78% and at levels above 1.5 mg/L with a concordance of 72%. Presence of total phosphorus at levels above 0.06 mg/L were predicted with a concordance of 67 %. From the models that we have developed, we will be able to predict the presence of pesticides and nutrients at the levels stated above for most of our sample population of first-order watersheds. These models will enable managers to compare watersheds and make preliminary decisions about where to allocate resources for additional monitoring or remediation.